Solar Panel Generation Efficiency as a function of various hazes and deposition

Dr. Rob Farber
Atmospheric Clarity

Some Preliminary Data

- A few measurements and estimates have been conducted for effects of PM deposition, urban pollution brush and forest fires
- For dry deposition the reduction is about 5-6% generation reduction
- For moderate urban haze about 10-15% generation reduction
- For thick haze such as the SJV in the winter as high as 30% reduction
- For thick haze from brush and forest fires between 15-30% reduction

Research Programs

- Conduct studies at various haze locations with different types of PV panels directly measuring the PV output
- Concurrently measure the total PM, the PM2.5 and composition of the haze. The major players are nitrates, organics such as soot, winter wood burning, diesel exhaust from snow removing equipment
- Develop algorithms for the relationship between haze, dry deposition and PV generation efficiency

Acknowledgements

- Dr. Vic Etyemezian, Desert Research Institute, Reno
- Dr. John Watson, Desert Research Institute, Reno
- Southern California Edison Meteorology Staff